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**Wallowa-Whitman
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**Blue Mountains
Pest Management Zone**

BMZ-95-11
September 15,
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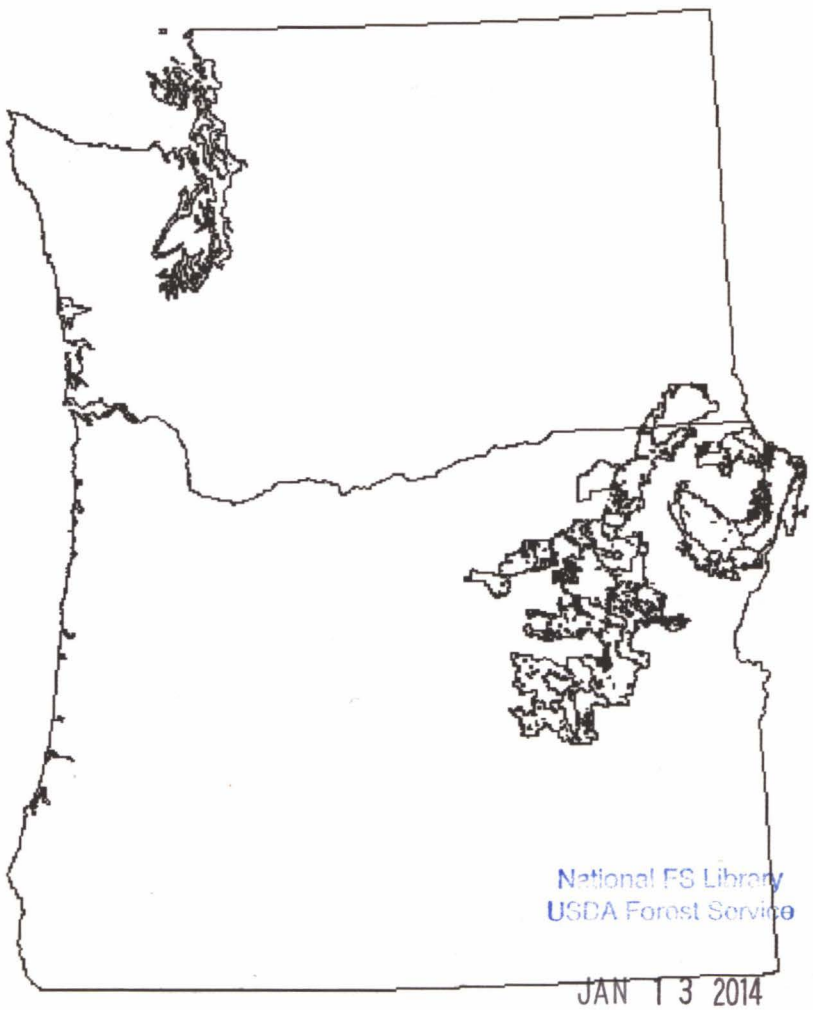
# Analysis of Insect and Disease Risks for the Wall Creek Watershed

By: Donald W. Scott
Craig L. Schmitt

Wall Creek Watershed Analysis Area



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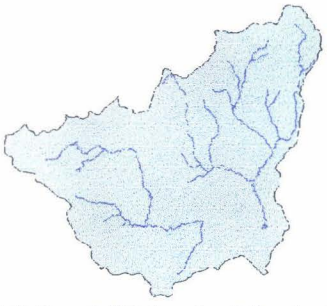

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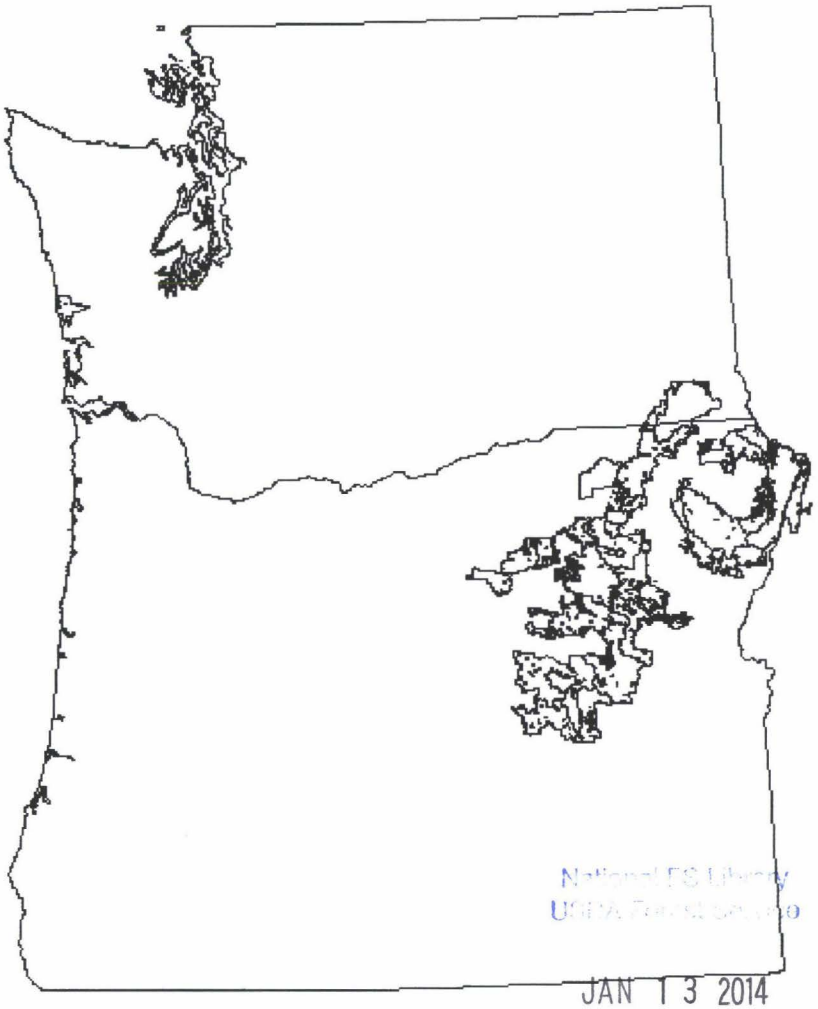

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# Analysis of Insect and Disease Risks for the Wall Creek Watershed

Donald W. Scott, Zone Entomologist
Craig L. Schmitt, Zone Pathologist

Blue Mountains Pest Management Zone
Wallowa-Whitman National Forest
La Grande, Oregon 97850

September 15, 1995

## Acknowledgments

This analysis was made possible by the assistance of Alan Agar, Umatilla NF Systems Analyst, and Ed Pugh, Umatilla NF. Alan constructed the UPEST software and produced the output database for this watershed. Ed and Alan assembled the input databases. We could not have completed this task in a timely manner without their assistance.

## Introduction

Insect and disease risks are determined using several published risk-rating or hazard-rating models, and/or other risk rating methodology built into the UPEST risk rating calculator, a computer program included in UTOOLS software (Ager *et al.* 1995a, 1995b). The classification of "risk" in regard to forest insects and diseases generally refers to the ***expectation*** of levels of tree mortality or damage from insects or diseases within a specified period of time, that interferes with management of resources associated with forested landscapes (adapted from Gast et al. 1991, and Shore and Safranyik 1992). Risk-rating models for important forest insects and diseases in the Blue Mountains, including bark beetles, defoliating insects, dwarf mistletoes, root diseases, and a stem decay have been incorporated into this version of UPEST, and contribute to this analysis.

The risk-rating calculator uses stand attribute data obtained by stand examinations or aerial photo interpretation. There has been no field verification of the accuracy of the risk indices produced by UPEST for this analysis, nor have we field-verified current or potential insect and disease incidence or severity information; thus, for insect and disease ratings, these results should be viewed in the context of relative likelihood of risk of occurrence and severity, rather than actual on-the-ground situations. It will be imperative, at the project or stand level, to use actual occurrence and severity information, along with risk probabilities, in designing prescriptions for stand treatments. These UPEST ratings will be of most use in determining

areas likely to be experiencing insect and disease affects, and estimating broad-scale forest health conditions.

Since various risk-rating models calculate risk indices in differing formats, we have attempted to standardize the format for reporting the risk ratings for each insect and disease calculated by the UPEST program in the summaries that follow. In each case, there are three levels of risk identified: low, medium, and high. These should be viewed in relative terms. That is, the demarcation between high and medium, and medium and low is artificial, and there is only a relative likelihood of a given insect or disease being more active in the higher risk rating. However, since these ratings do identify relative risk, most attention should be given to those subwatersheds that are identified as having high and medium ratings for multiple insects and diseases. Differences in methodology used in calculating various insect risk-rating indices, and therefore differences in the meaning of these indices, dictate that some care be exercised in interpreting these indices. In the case of bark beetle risks, for example, a rating of "high" generally means that current vegetation, and physiographic conditions are such that there is a high likelihood that serious stand damage (i.e., tree mortality) **could** occur in the event of insect population increase to outbreak. Interpretation of risk indices for defoliators, on the other hand, is slightly different, and depends on which defoliator is being rated. For example, a "high" rating for Douglas-fir tussock moth means that there is a greater than 60-percent probability that a subwatershed would be defoliated by tussock moth in the event of an outbreak; whereas, a "high" rating for western spruce budworm means that stands within the subwatershed are expected to incur greater than 50-percent defoliation during the course of a budworm outbreak. Ratings of "low" for both insects and diseases generally mean that host, site, past management, and other conditions are not suited at the present time for development of insect or disease epidemics. It does not necessarily mean that there is **no** level of insect or disease activity present in stands, although this may be the case where stands are composed of non-host species. Unless otherwise specified, stands that are composed of non-host species, or where no forest trees exist, are included in the "low" risk category for both insects and diseases by the models. Thus, low risk means both "**low**" and "**no**" risk.

A composite rating has not been given for all insects and diseases in the UPEST analysis. This is partially because different management objectives would allow different weights be applied to different components of a composite score. That is, those insects and diseases that result in conifer mortality would be considered differently from those insects and diseases that cause growth reduction and stem decay depending upon the management allocation. It is possible to design queries in the UVIEW landscape visualization program (Ager *et al.* 1995a) to identify composite risks for any combinations of insects and diseases.

The Wall Watershed Analysis Area is located in the southwestern portion of the Heppner Ranger District, Umatilla National Forest. This watershed drains into the North Fork of the John Day River, which is several miles south of the watershed.

In the discussions of each insect and disease risk that follow the risk map for that insect or

disease, it may be noted that the total acreage of the combined risk categories for an insect or disease is less than the total acreage for that subwatershed. This is due to missing or fragmentary data in the database that prohibited us from running that risk model on those pixels that contained missing data for one or more model components. Thus, the mapped and reported acreage includes only those pixels that contained complete data, and could be analyzed. The disease models examined a total of 91,387 acres of the database distributed in 15 subwatersheds, while the insect models examined a total of 93,047 forested acres. Most of the stand information was complete; only 1,668 forested acres did not have enough data to run most of the insect and disease models. However, some additional acres contained certain missing data components that did not permit the model to analyze these acres. These acres are indicated by columns labeled "missing data" in the tables at the end of this report. The entire watershed contained a total of 93,047 GIS map acres. The area that was analysed is indicated in Figure 1 as that portion within the boundary that is colored. A portion of the total watershed acres are in private ownership for which no stand data exists. They do not contribute to the analysis of insect or disease risk although each acre contains an unknown risk component for each insect and disease covered by this report.

It is important to note that UPEST is an experimental insect and disease risk calculator that uses some models which have not been validated for the Blue and Wallowa Mountains. In order to run several of the models with photointerpreted data, it was first necessary to make certain assumptions to relate photointerpreted data to stand-based data, and then compute the model variables (see Ager et al. 1995b for a list of model variables and methods for estimating certain model components).

There is one final caveat regarding accuracy of the risk indices. While we are confident that the models are correctly computing risk as the authors had intended, we cannot vouch for the accuracy of the data used by the models. The models are only capable of computing the insect and disease risks reflected by the vintage of the data. Since some of the data from the Forest's corporate database which were used by UPEST were from stand exams taken several years ago, vegetation condition, species composition, and other stand components and parameters used by the models may have changed in the interim period. Datasets that have not been updated since the time of the exam could possibly lead to different risk indices compared with analyses using more recently acquired data. For example, a risk rating computed for an insect on an area where a recent fire occurred, using recently acquired data, would by entirely different than a risk rating for the same insect on the same area following the fire, using pre-fire vintage data.

# Discussion of Insect and Disease Risks

The following analyses provide risk indices maps for the Wall Creek Watershed, along with a brief discussion of the risks generated by UPEST for each of 14 different insects and diseases. Note that the colors on each map indicate the following levels of risk: Green= Low Risk; Yellow= Moderate Risk; and Red= High Risk.

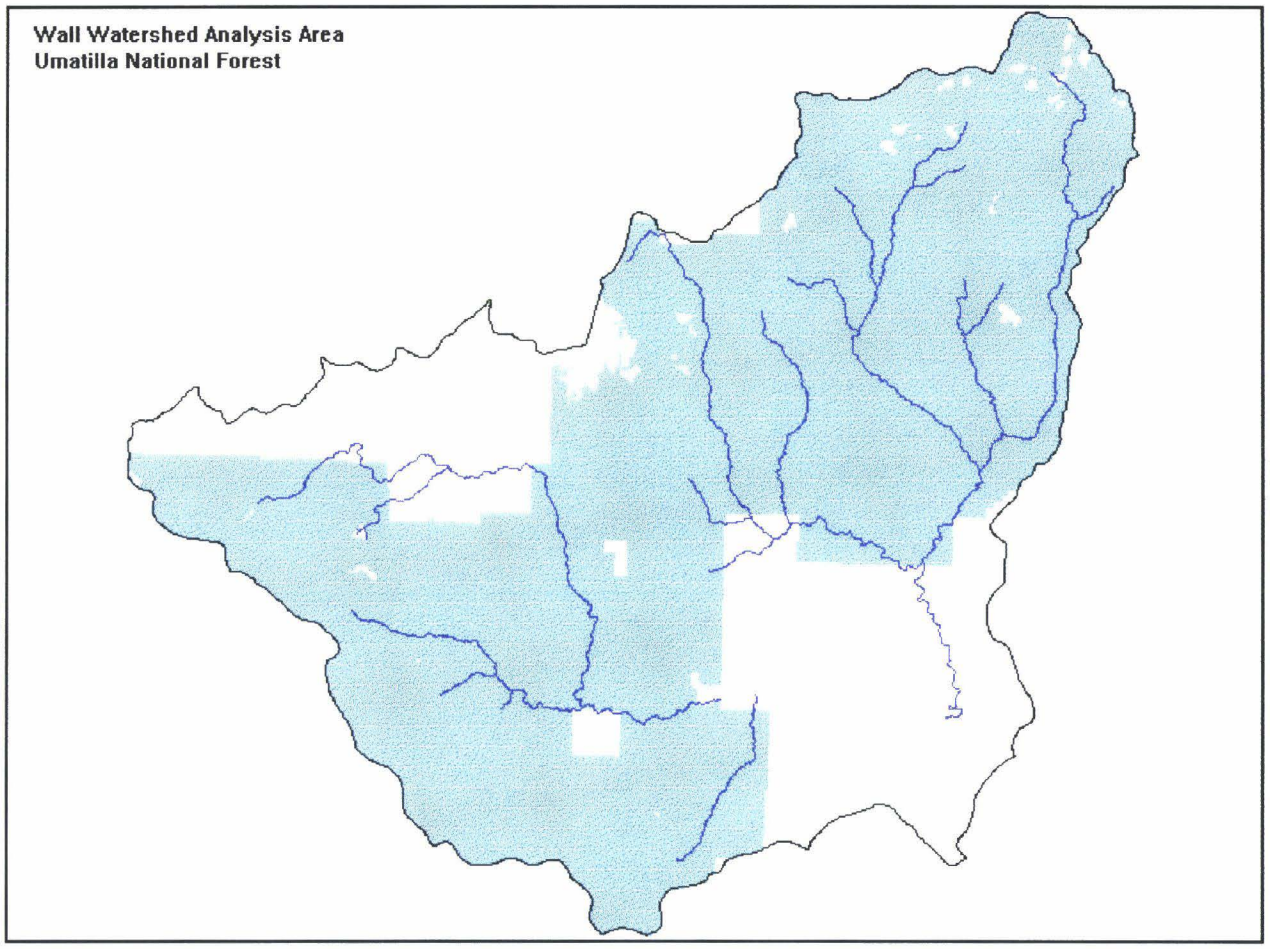


**Figure 1. Boundary of Wall Creek Watershed Analysis Area and the colored area that was subject to individual insect and disease risk analysis by UPEST where required data were available.**

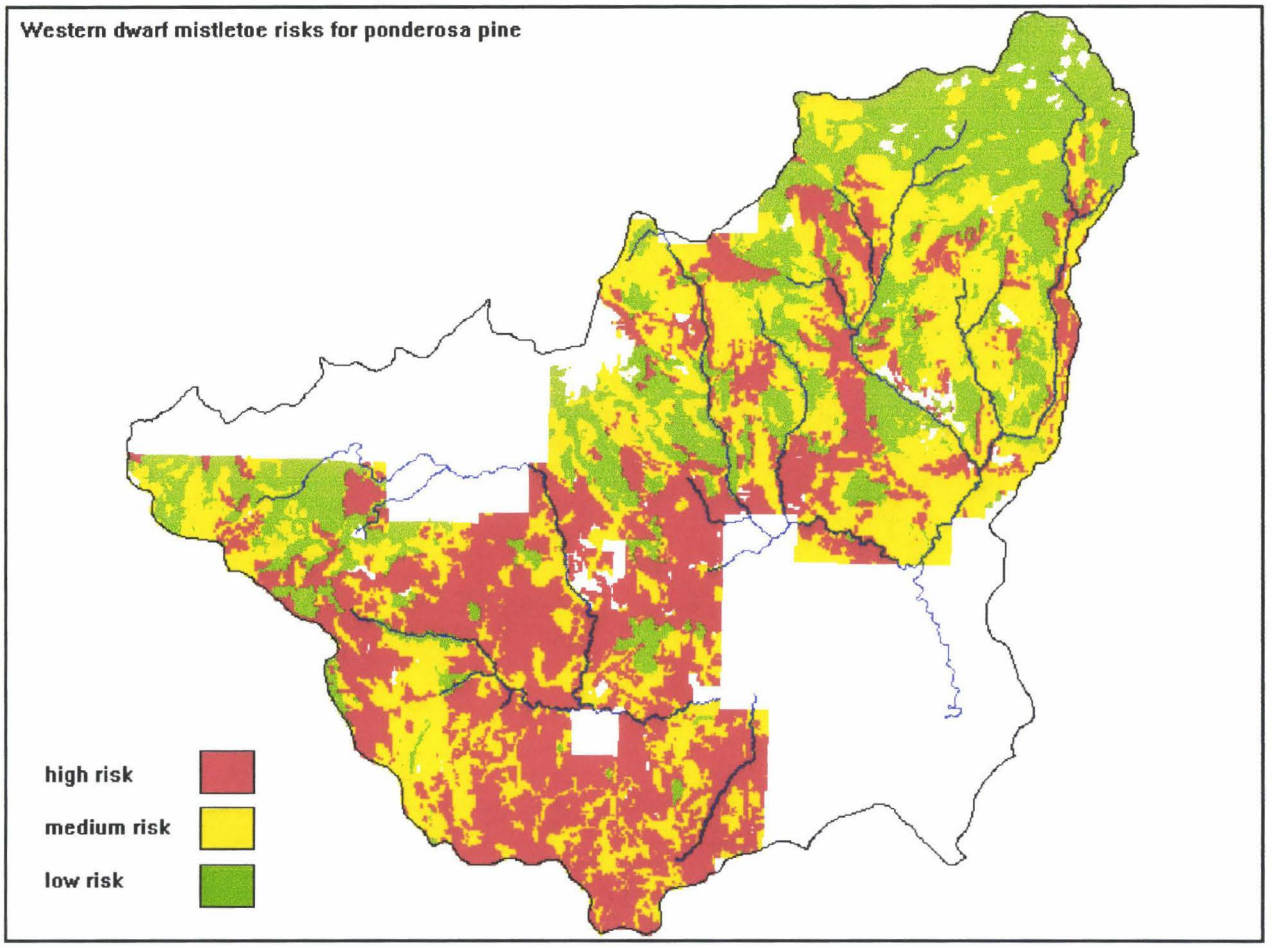


**Figure 2. UPEST generated risks for western dwarf mistletoe incidence and severity affecting ponderosa pine in the Wall Creek Watershed.**

Western dwarf mistletoe of ponderosa pine (*Arceuthobium campylopodum*) risks of infection and severity are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Creek Watershed, 91,379 acres could be evaluated by the ponderosa pine dwarf mistletoe model. Of the area evaluated, 24,198.94 acres are low risk; 32,644 acres are medium risk; and 34,536 acres are high risk. 1,669 acres could not be evaluated. Western dwarf mistletoe is known to be common in this area. Many of the areas indicated to be high and medium risk are likely infected. There will be stands that are indicated to be at medium and high risk that are uninfected. Field checking subwatersheds or queries of the stand exam database could be used to determine areas that are infected.

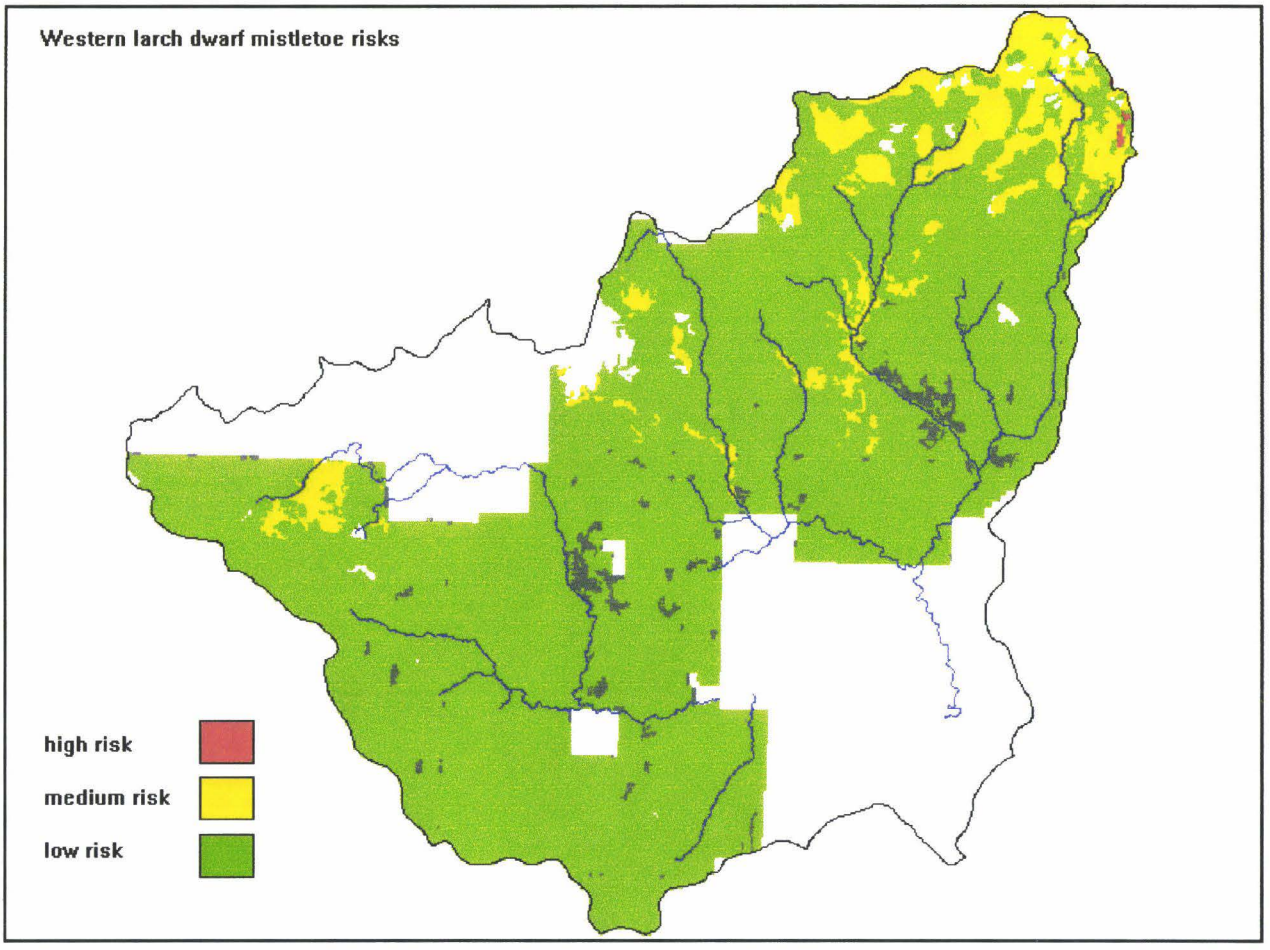


**Figure 3. UPEST generated risks for western larch dwarf mistletoe incidence and severity in the Wall Creek Watershed.**

Western larch dwarf mistletoe (*Arceuthobium laricis*) risks of infection and severity are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Creek Watershed, 91,378 acres could be evaluated for western larch dwarf mistltetoe. Of the area evaluated, 83,115 acres are low risk; 8,232 acres are medium risk; and 30 acres are high risk. Only 1,669 acres could not be evaluated because of missing data.

Most of the area rated medium and high risk is towards the northern portion of the watershed; in the vicinity of Tupper Guard Station and south of Madison Butte. These areas are known to have severe levels of larch dwarf mistletoe. The bulk of the watershed has a minor component of larch and is thus, low risk.

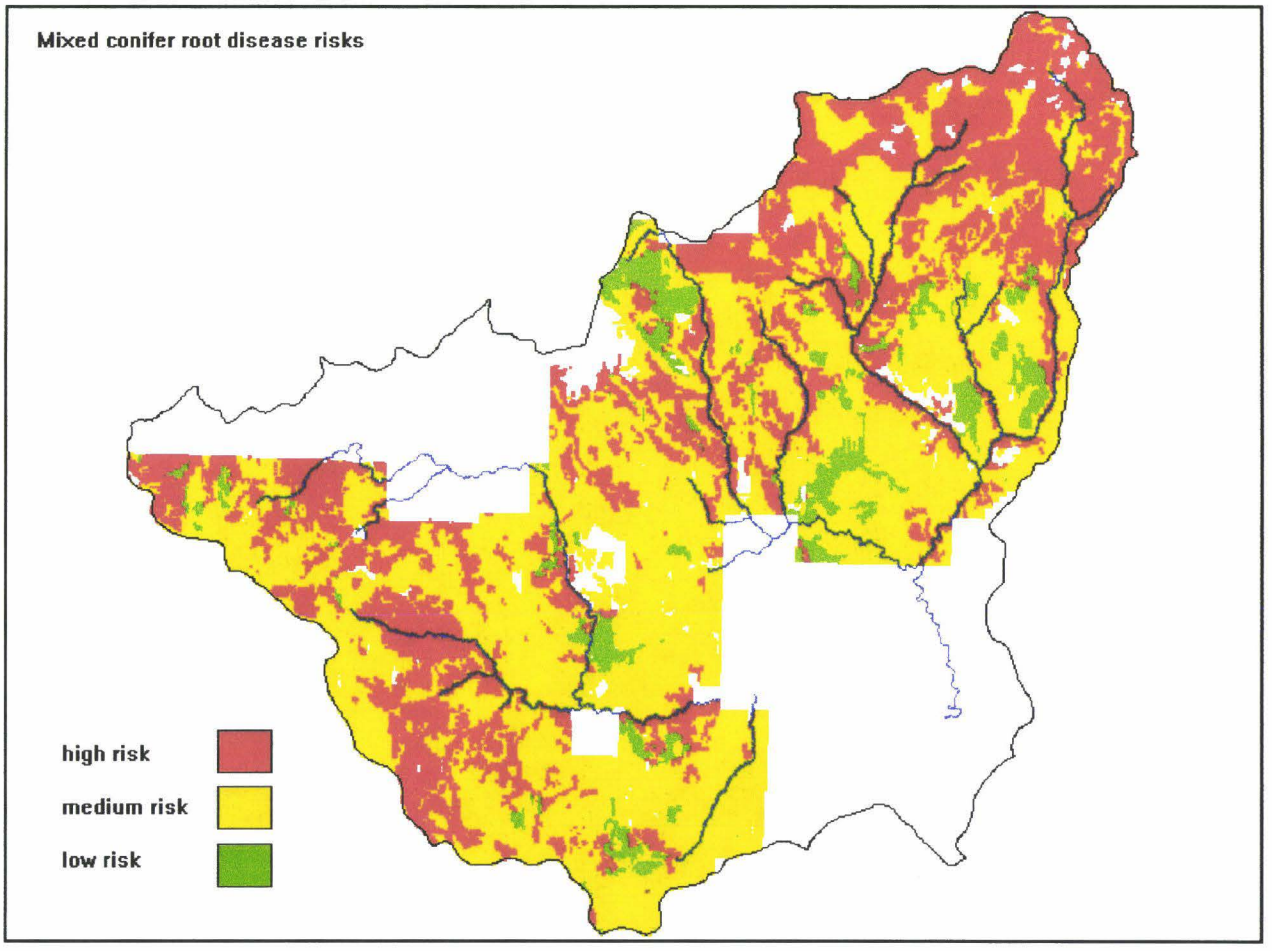


**Figure 4. UPEST generated conifer root disease risks in the Wall Creek Watershed.**

Conifer root diseases including laminated root rot (*Phellinus weirii*), annosus root disease (*Heterobasidion annosum*), and armillaria root disease (*Armillaria ostoyae*) risks of infection and severity are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Watershed, 90,889 acres could be evaluated for mixed conifer root disease. Of the area evaluated, 4,997 acres are low risk; 56,026 acres are medium risk; and 29,866 acres are high risk. Only 2,178 acres could not be evaluated due to missing data.

Most mixed conifer stands are rated medium to high throughout the watershed. A severe infestation of laminated root rot is known in the Alder Creek drainage and Madison Butte area near Tupper Guard Station. Armillaria root disease is known to occur throughout the mixed conifer stand types in this area.

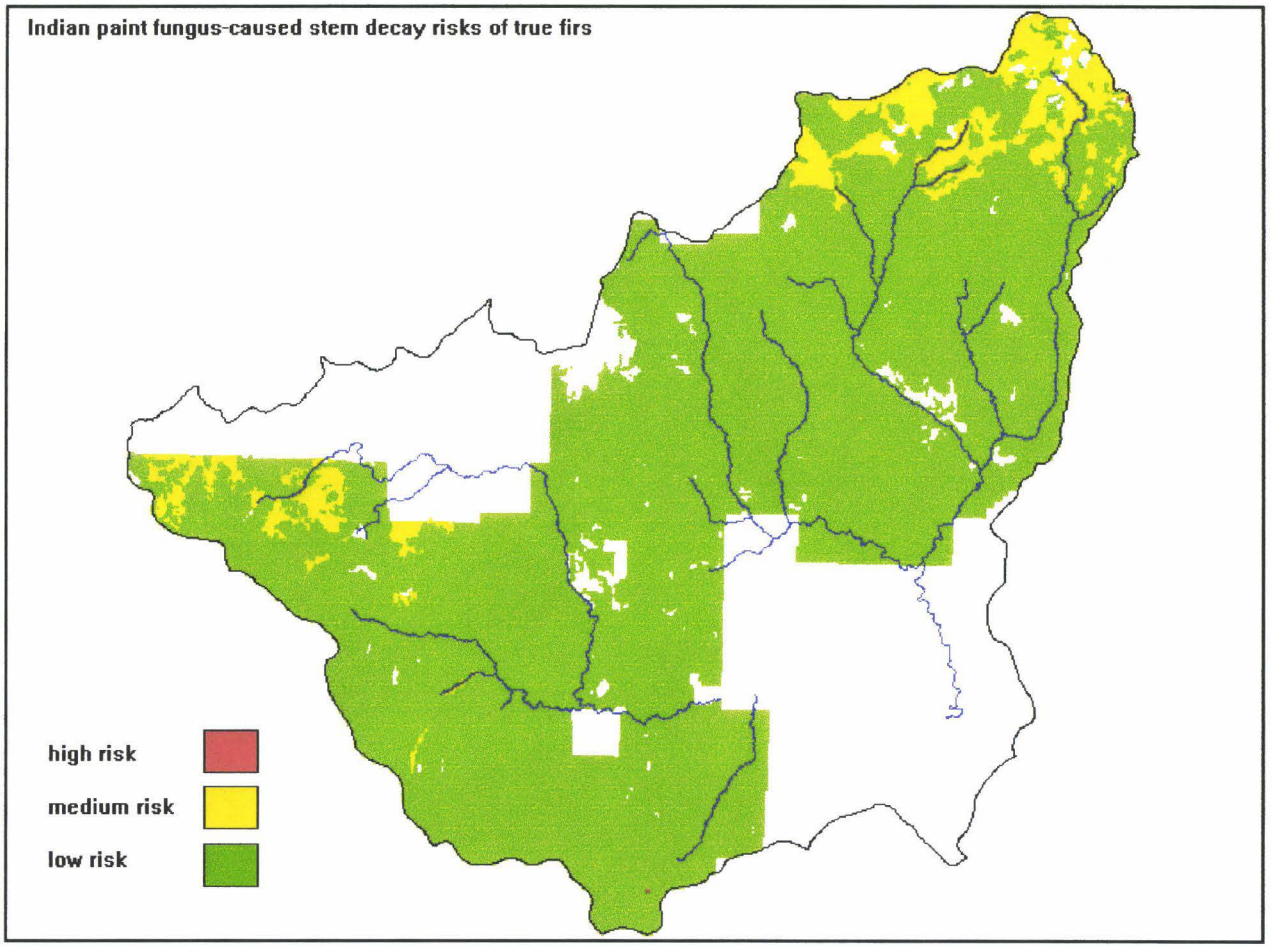


**Figure 5. UPEST generated risks for Indian paint fungus-caused decay in the Wall Creek Watershed.**

Indian Paint fungus (*Echinodontium tinctorium*) risks of decay of true firs are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Creek Watershed, 91,379 acres could be evaluated for indian paint fungus-caused stem decay. Of the acres evaluated, 84,706 acres are low risk; 6,670 acres are medium risk; and 2 acres are high risk. Only 1,669 acres couldn't be evaluated because of missing data.

Indian paint fungus-caused decay is most likely to be significant in the older grand -fir-dominated stands in the watershed. Areas of likely infection are the older grand fir-dominated stands indicated as being medium risk. Such stands exist in the northern portion of the watershed and in the western portion in the fir stands around Fairview Campground.

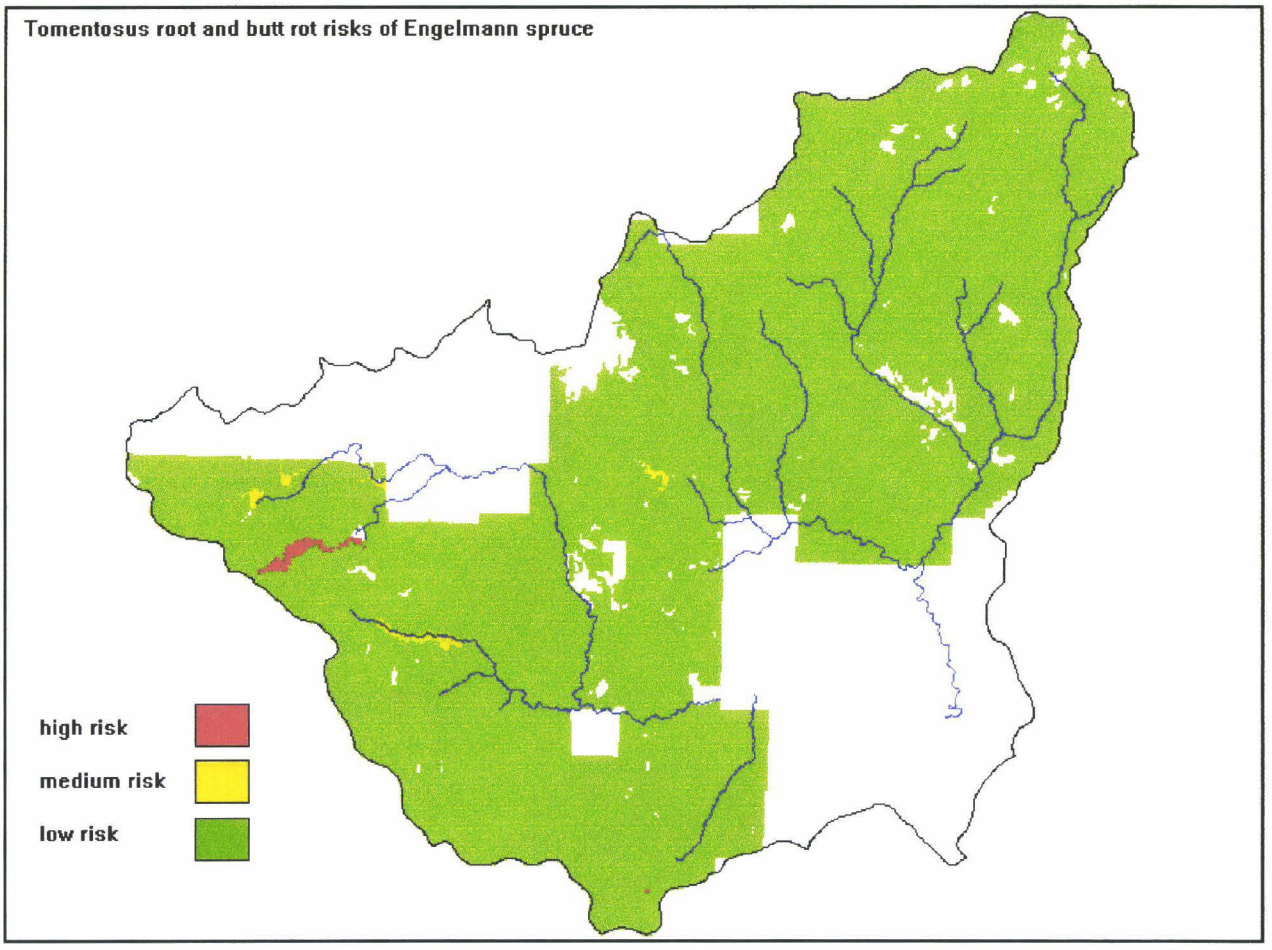


**Figure 6. UPEST generated risks for tomentosus root and butt rot of Engelmann spruce in the Wall Creek Watershed.**

Tomentosus root and butt rot (caused by *Inonotus tomentosus*) risks to Engelmann spruce are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Creek Watershed, 91,378 acres could be evaluated for tomentosus root and butt rot. Of the area evaluated, 90,741 acres are low risk; 416 acres are medium risk; and 222 acres are high risk. Only 1,669 acres could not be evaluated because of missing data.

Only a small portion of the watershed is rated medium and high risk to tomentosus. These are creek bottoms in the higher elevation reaches in the area. All the "high"-rated stands are in the drainage along the 2039 Road between Wilson Prairie and Fairview Campground. The majority of this watershed is not in the appropriate host type for this disease.

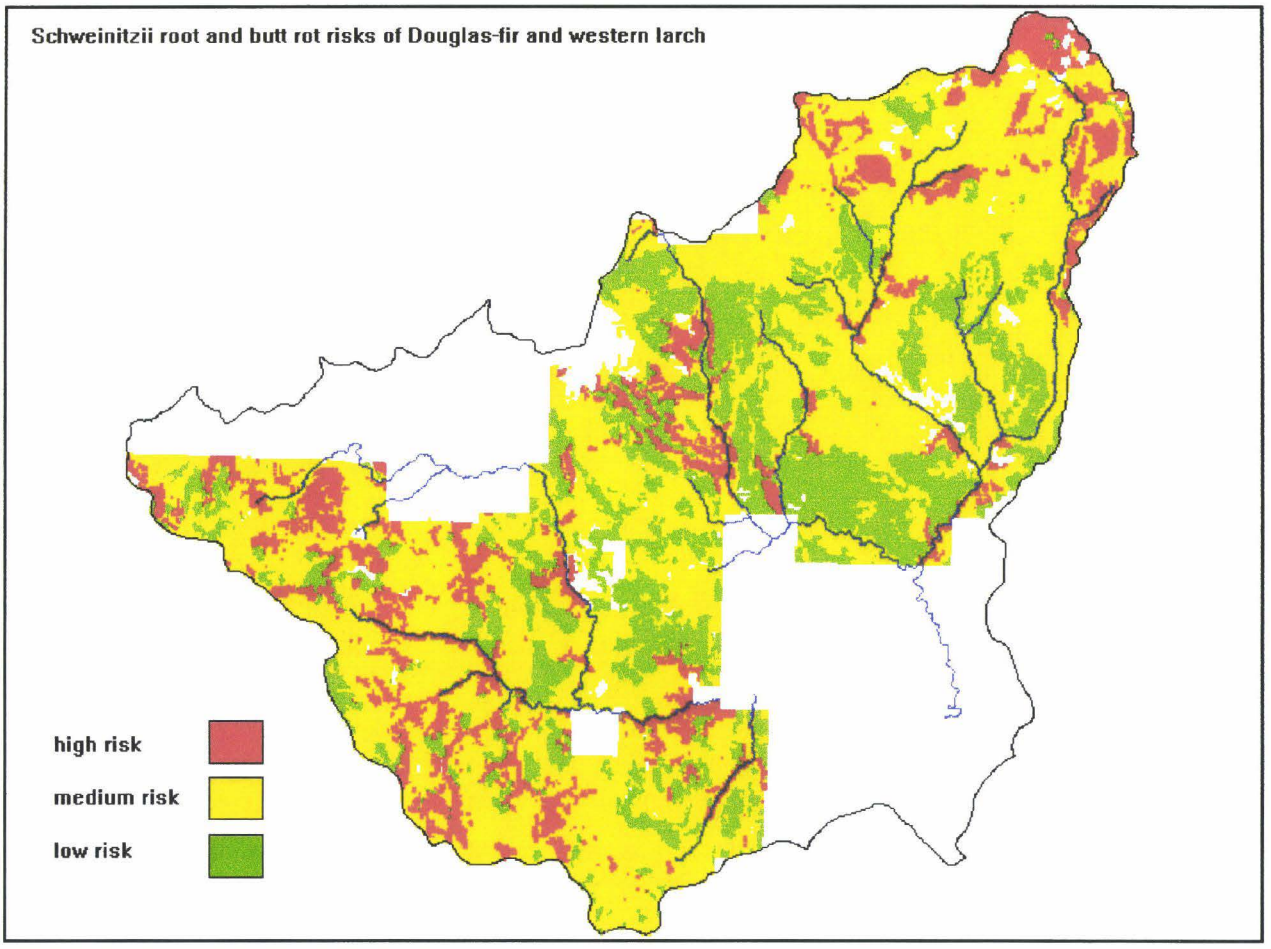


**Figure 7. UPEST generated risks for Schweinitzii root and butt rot in the Wall Creek Watershed.**

Schweinitzii root and butt rot (caused by *Phaeolus schweinitzii*) risks of decay to conifers are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Creek Watershed, 91,379 acres could be evaluated for Schweinitzii root and butt rot. Of the area evaluated, 19,847 acres are low risk; 58,908 acres are medium risk; and 12,624 acres are high risk. Only 1,669 acres could not be evaluated due to missing data.

Most of this analysis area is rated medium and high to schweinitzii root and butt rot. These are mostly the Douglas-fir dominated stands in all but the lower elevation and south-facing aspects, which are mainly ponderosa pine-dominated stands.

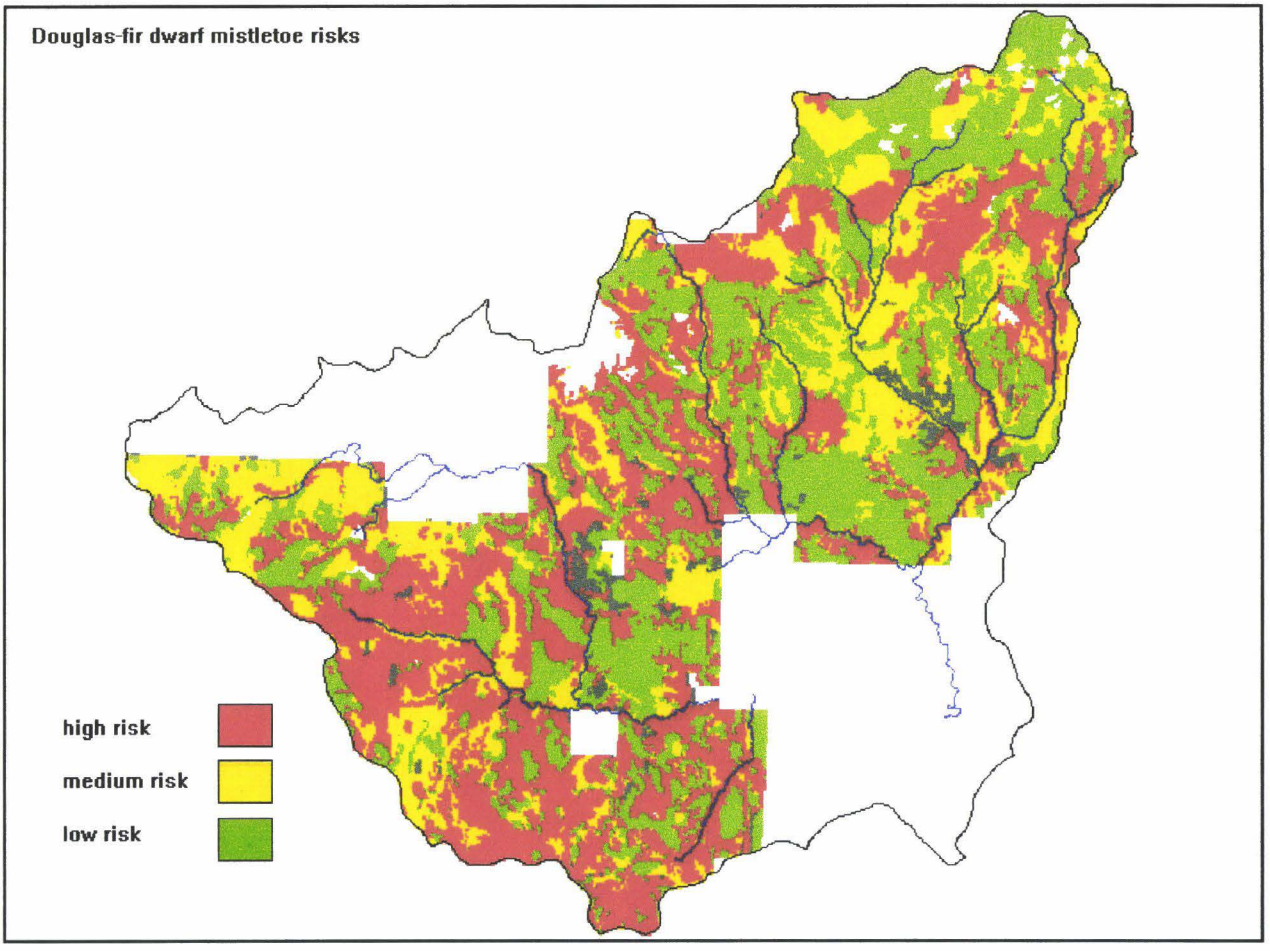


**Figure 8. UPEST generated risks for Douglas-fir dwarf mistletoe incidence and severity in the Wall Creek Watershed.**

Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*) risks of infection and severity are calculated by UPEST and categorized at three levels: low, medium, and high, based on methodology developed by Schmitt (1994).

In the Wall Creek Watershed, 91,379 acres were evaluated for Douglas-fir dwarf mistletoe. Of the area evaluated, 32,755 acres are low risk; 23,755 acres are medium risk; and 35,309 acres are high risk. Only 1,669 acres could not be evaluated due to missing data.

Douglas-fir dwarf mistletoe is known to be severe throughout much of this of this watershed. The risk ratings are believed to correspond reasonably well to actual infection levels.

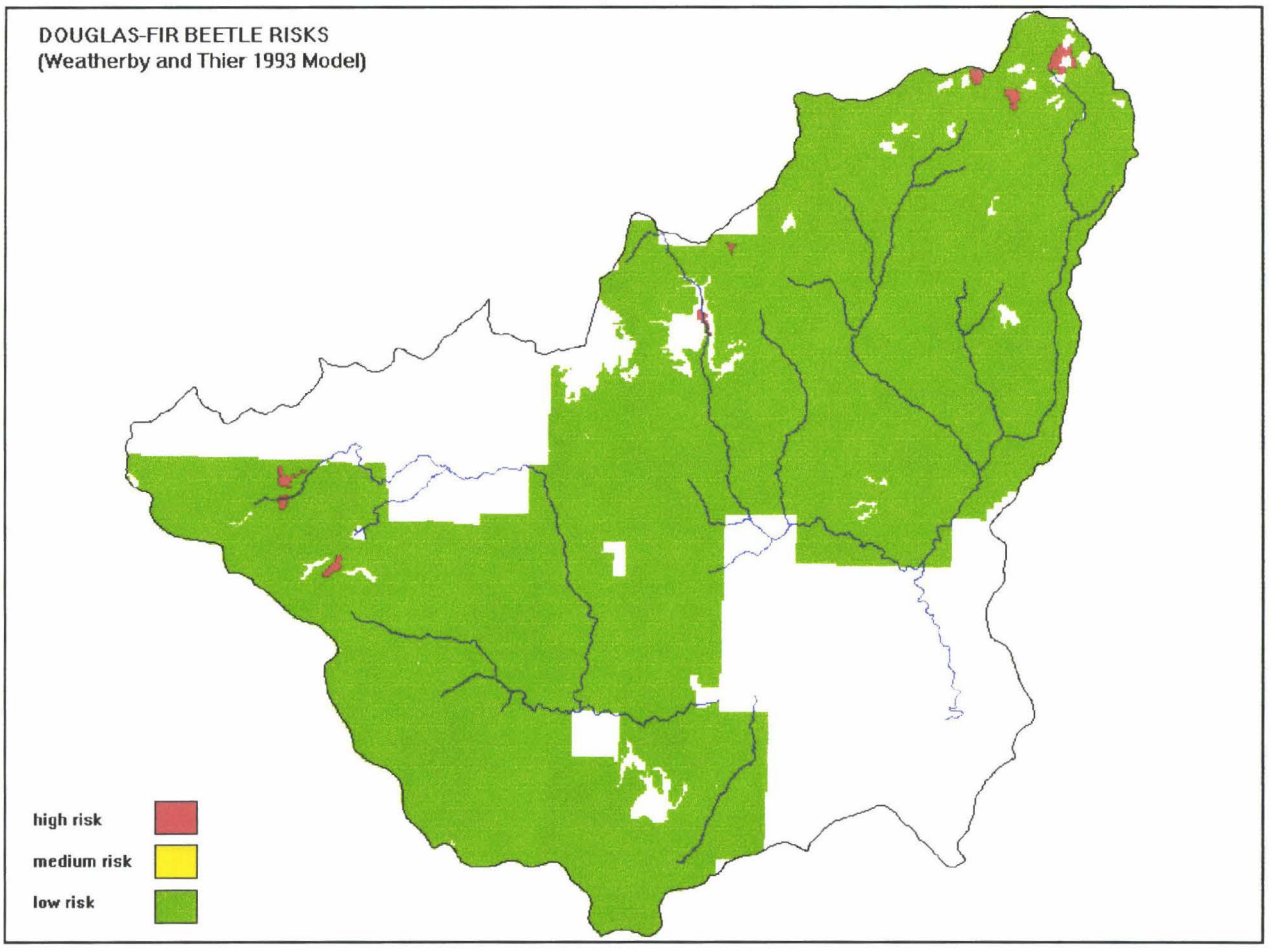


**Figure 9. UPEST generated risk map for potential Douglas-fir beetle-caused tree mortality in stands of the Wall Creek Watershed.**

Douglas-fir beetle (*Dendroctonus pseudotsugae*) risks to Douglas-firs within the Wall Creek Watershed are calculated by UPEST and categorized at three levels: low, medium, and high. A breakdown by percent of acres in each risk level, by subwatershed, is given in the appendices following this section.

In the Wall Creek Watershed, 93,047 acres could be evaluated by the Douglas-fir beetle model in UPEST. The model identified 91,297 of the total acres as low risk to Douglas-fir beetle, none as moderate risk and 342 acres as high risk. The remaining 1,408 acres could not be evaluated by the model due to missing data from mostly private lands. Creek bottoms (riparian areas) and mixed conifer old-growth stands are typically those areas showing greatest susceptibility to Douglas-fir beetles. Some of these stands have undergone infestations, or are currently infested by populations of Douglas-fir beetles, based on recent aerial insect detection surveys. Stands weakened by budworm and drought are also very susceptible to bark beetles.

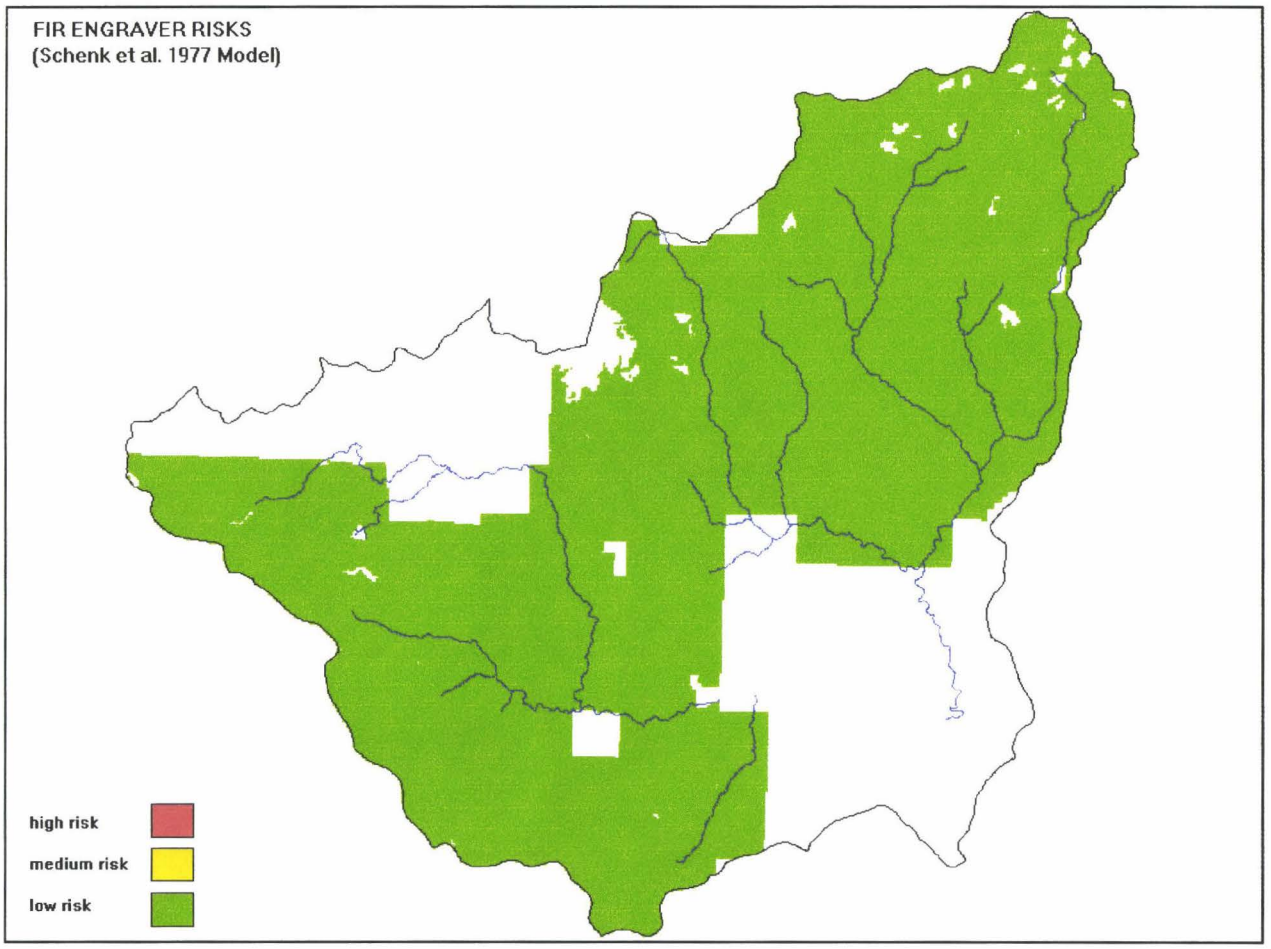


**Figure 10. UPEST generated risk map for potential fir engraver beetle-caused tree mortality in stands of the Wall Creek Watershed.**

Fir engraver beetle (*Scolytus ventralis*) risks to true fir (primarily grand fir) stands within the Wall Creek Watershed are calculated by UPEST and categorized at three levels: low, medium, and high. A breakdown by percent of acres in each risk level, by subwatershed, is given in the appendices following this section.

In the Wall Creek Watershed, 93,047 acres could be evaluated by the fir engraver beetle model in UPEST. The model identified 92,971 of the total acres as low risk to fir engraver beetles, no acres as moderate risk, and no acres as high risk. The remaining 76 could not be evaluated by the model due to missing data on mostly private lands. The model does not take into account root disease levels or potential levels in stands to compute risk, otherwise acreages in moderate and high categories would have been identified. There is a very high correlation between root disease and fir engraver incidence in the Pacific Northwest. Studies have found that around 85 percent of trees attacked by fir engravers also have root disease. Stands weakened by budworm and drought are also extremely susceptible, but the current model does not include these components.

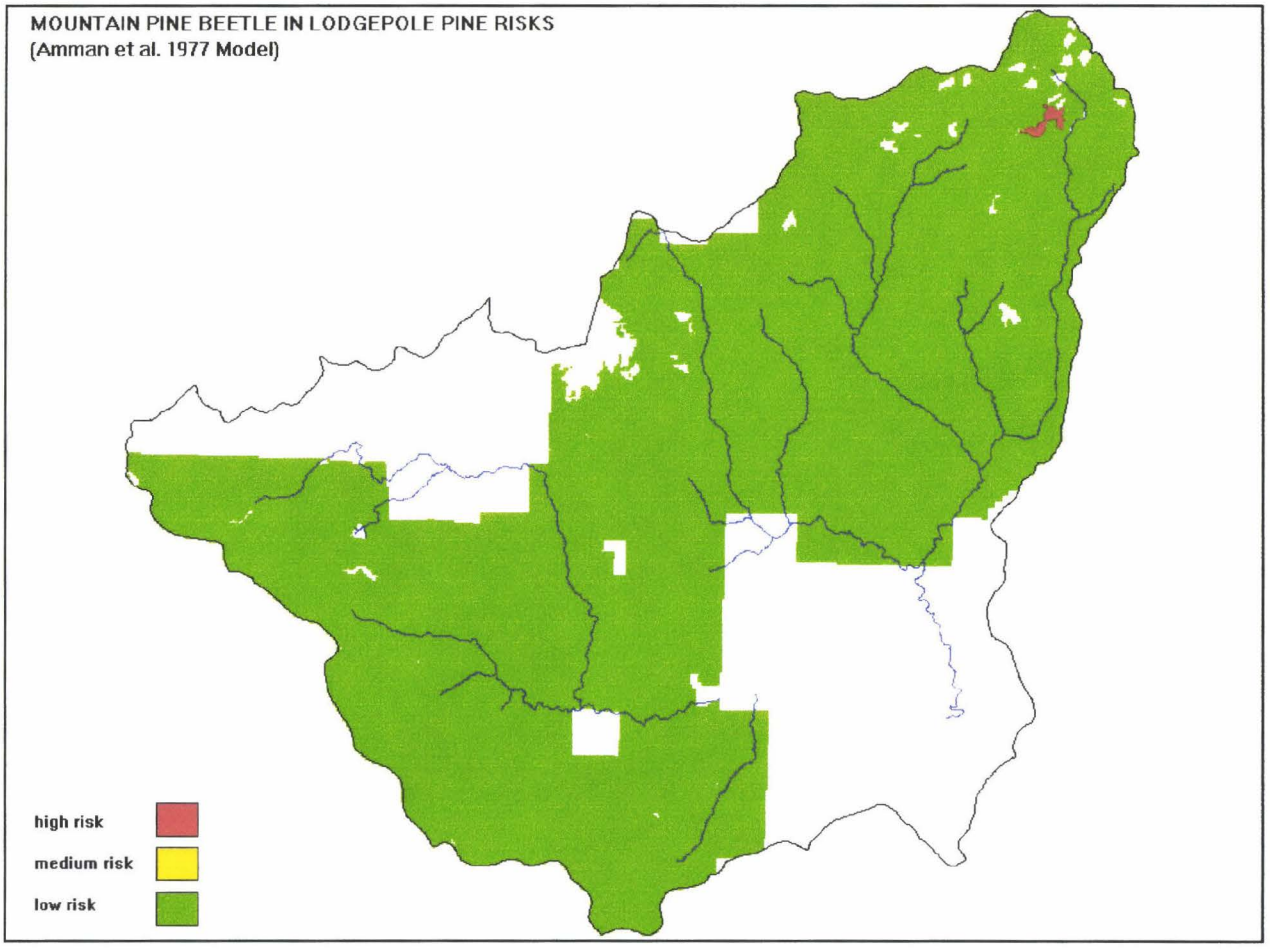


**Figure 11. UPEST generated risk map for potential mountain pine beetle-caused tree mortality in lodgepole pine stands of the Wall Creek Watershed.**

Mountain pine beetle (*Dendroctonus ponderosae*) risks to lodgepole pine stands within the Wall Creek Watershed are calculated by UPEST and categorized at three levels: low, medium, and high. A breakdown by percent of acres in each risk level is given in the appendices following this section.

In the Wall Creek Watershed, 93,047 acres could be evaluated by the mountain pine beetle in lodgepole pine model in UPEST. The model identified 92,906 of the total acres as low risk to mountain pine beetle in lodgepole pine, none at medium risk, and 141 at high risk.

A major mountain pine beetle epidemic on the Forest occurred during the late 1960's through the late 1970's. Some of the stands of old-growth lodgepole pine on the Heppner Ranger District were involved in this outbreak. An earlier major mountain pine beetle outbreak started in lodgepole pine on the Hells Canyon National Recreation Area at about the turn of the century and extended throughout much of the Blue Mountains. Stands on the Heppner Ranger District, including the Wall Creek Watershed, were likely involved in this early outbreak of mountain pine beetle.

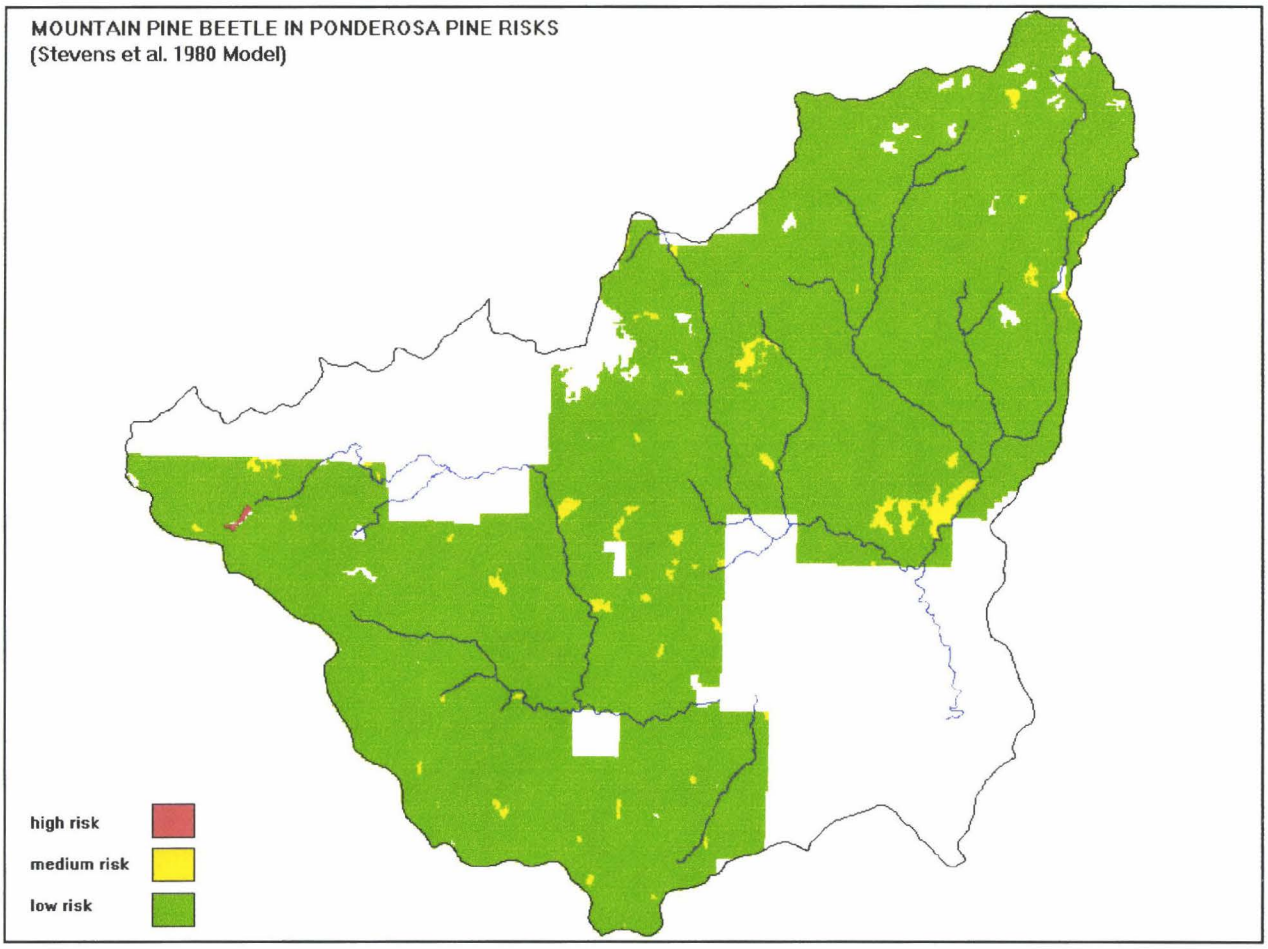


**Figure 12. UPEST generated risk map for potential mountain pine beetle-caused tree mortality in ponderosa pine stands of the Wall Creek Watershed.**

Mountain pine beetle risks to ponderosa pine stands within the Wall Creek Watershed are calculated by UPEST and categorized at three levels: low, medium, and high. A breakdown by percent of acres in each risk level is given in the appendices following this section.

In the Wall Creek Watershed, 93,047 acres could be evaluated by the mountain pine beetle in ponderosa pine model in UPEST. The model identified 91,176 of the total acres as low risk to mountain pine beetle in ponderosa pine, 1,746 at medium risk, and 32 acres at high risk. An additional 93 acres could not be analyzed due to missing data from mostly private lands within the watershed.

The majority of high risk areas are at mid-elevations and occur in overstocked second-growth ponderosa pine stands. Dense stands have become highly susceptible to mountain pine beetles. Some stands had been thinned during the 1970's, and are now growing back into competition, with increased susceptibility to beetles. More recently thinned stands will remain resistant to beetles for awhile. Dought stress is a major factor contributing to recent buildup up of populations of mountain pine beetle, and especially pine engravers (*Ips pini*), in the watershed.

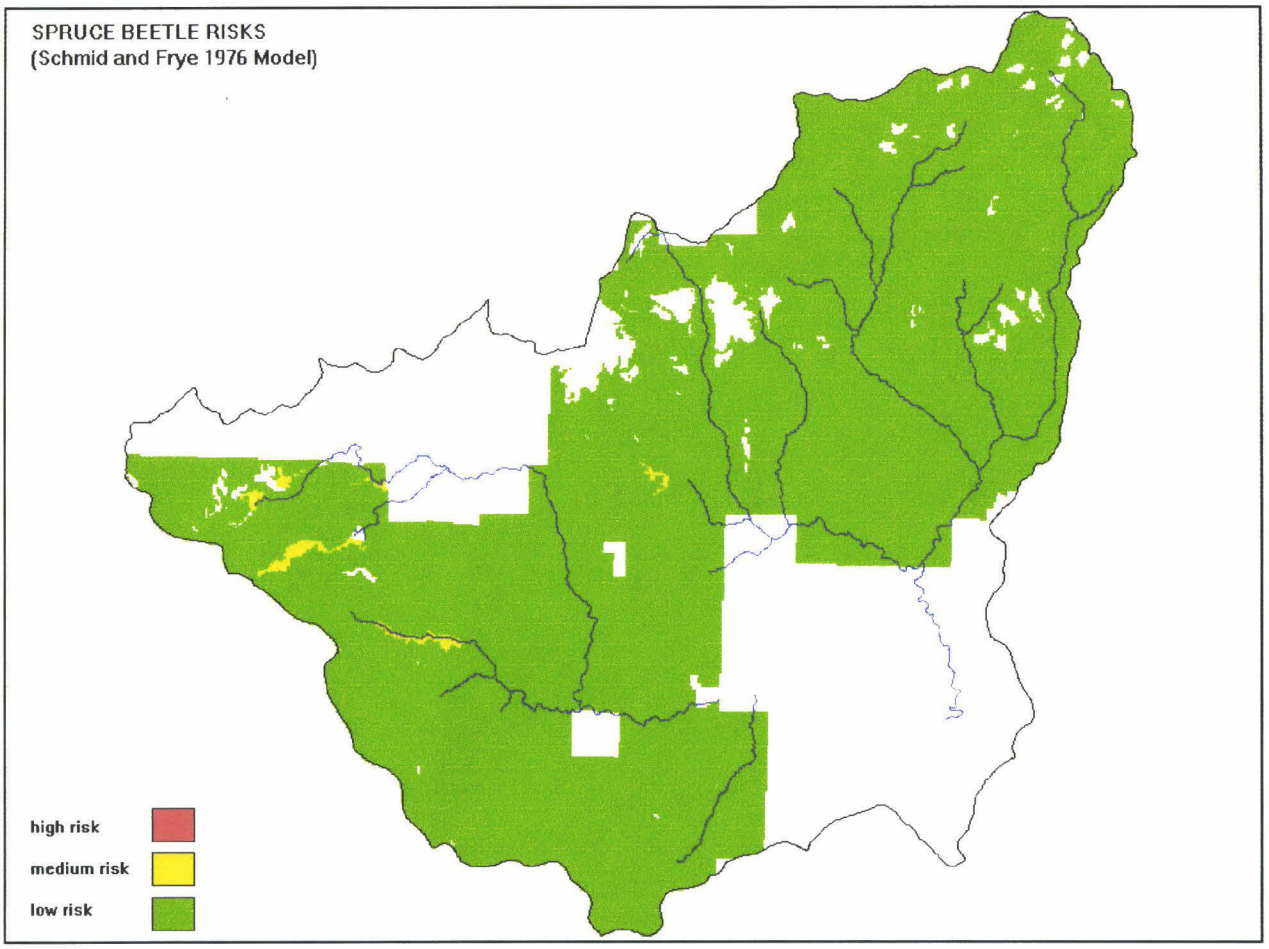


**Figure 13. UPEST generated risk map for potential spruce beetle-caused tree mortality in Engelmann spruce stands of the Wall Creek Watershed.**

Spruce beetle (*Dendroctonus rufipennis*) risks to Engelmann spruce stands within theWall Creek Watershed are calculated by UPEST and categorized at three levels: low, medium, and high. A breakdown by percent of acres in each risk level is given in the appendices following this section.

In the Wall Creek Watershed, 93,047 acres could be evaluated by the spruce beetle model in UPEST. The model identified 90,464 of the total acres as low risk to spruce beetle, 645 at medium risk, and no acres at high risk. In addition, 1,939 acres could not be analyzed due to missing data on mostly private lands.

Higher risk stands are typically associated with better growing sites along creek bottoms. The Wall Creek Watershed does not appear to have many stands that would be affected by the spruce beetle in the unlikely event that populations were ever to increase to outbreak.

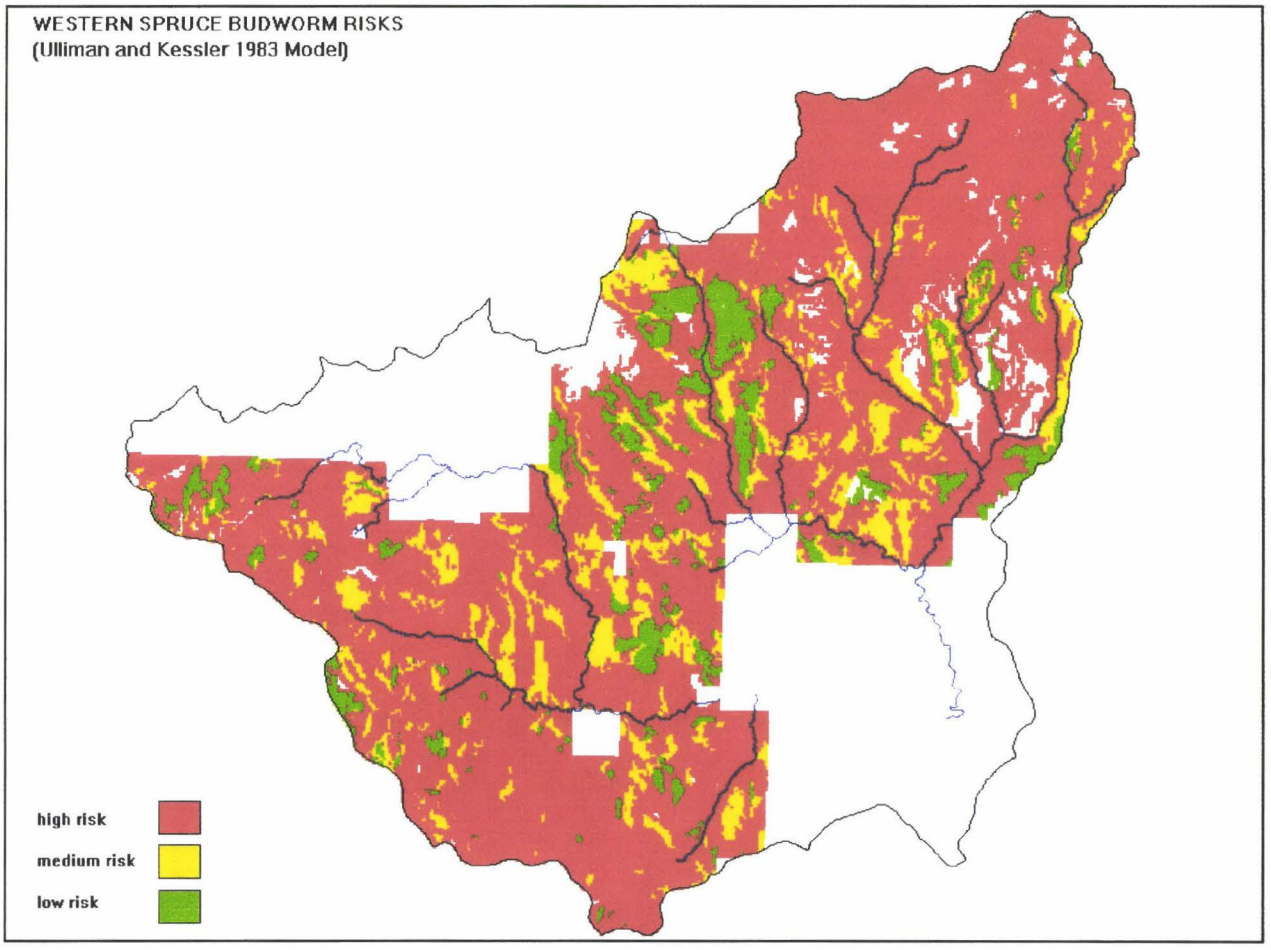


**Figure 14. UPEST generated risk map for potential rates of western spruce budworm-caused defoliation in the Wall Creek Watershed.**

Western spruce budworm (*Choristoneura occidentalis*) potential rates of defoliation of true firs and Douglas-firs are calculated by UPEST and categorized at three levels: low--0-25 percent defoliation; medium--26 to 50 percent defoliation; and high--51 and higher percent defoliation. A breakdown by percent of acres in each risk level is given in the appendices following this section.

In the Wall Creek Watershed, 90,456 acres could be evaluated by the spruce budworm model in UPEST. The model identified 6,042 of the total acres at risk of low defoliation rates by budworm, 12,974 at risk of medium rates, and 71,371 acres at risk of high rates of defoliation. The remaining 69 acres could not be rated due to missing data from mostly private lands.

Presently, the risk-rating model for budworm identifies 77% of the watershed at risk of sustaining high rates of defoliation. Budworm caused serious tree defoliation in some parts of the Wall Creek Watershed from roughly 1980-1992. Many stands in the watershed contain high stocking levels and multiple-storied mixed conifer canopies. These conditions are most favorable for population buildup of budworm in the future. Uneven-aged, multi-storied stands are favored budworm habitat and have greater risk of being damaged by budworm than evenaged stands. Budworm defoliation predisposed some true firs and Douglas-firs to bark beetles following the outbreak. Bark beetles are active in some of these stands today.

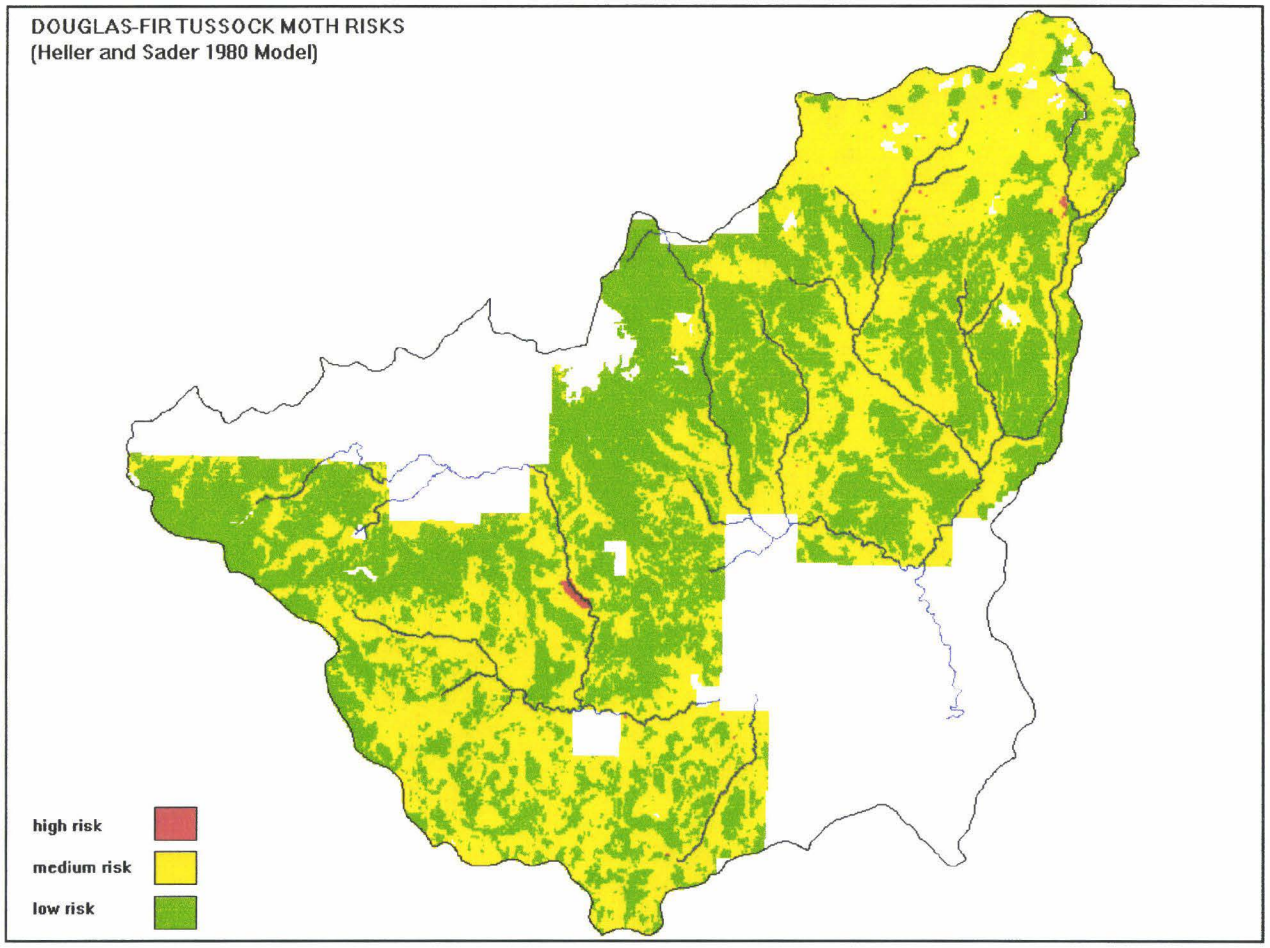


**Figure 15. UPEST generated risk map for probability rates of Douglas-fir tussock moth defoliation in the Wall Creek Watershed.**

Douglas-fir tussock moth (*Orgyia pseudotsugata*) probability rates of defoliation of true firs and Douglas-firs are calculated by UPEST and categorized at three levels: low--0-33 percent probability of defoliation; medium--34 to 67 percent probability of defoliation; and high--68 and higher percent probability of defoliation. A breakdown by percent of acres in each risk level is given in the appendices following this section.

In the WallCreek Watershed, 93,047 acres could be evaluated by the Douglas-fir tussock moth model in UPEST. The model identified 43,435 of the total acres with a probability of low defoliation rates by tussock moth, 49,494 with a probability of medium rates, and 118 with a probability of high rates of defoliation during a tussock moth outbreak.

The last major tussock moth outbreak affecting stands in the Blue Mountains occurred during the early to mid 1970's. The Wall Creek Watershed was affected by tussock moth during this last outbreak. Areas with greatest risk are those with multistoried true fir/Douglas-fir stands located on upper slopes and ridgetops, where ash depth is relatively shallow.

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# Appendices

## Wall Creek Watershed Disease Risks by Subwatershed (Percent Area) and Acres

Subwatershed: **24A** Acres: **5,984**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (2.7%) 163 | (36.4%) 2179 | (12.9%) 771 | (48.0%) 2871 |
| Ponderosa pine dwarf mistletoe risks | (2.7%) 163 | (4.9%) 294 | (35.7%) 2139 | (56.6%) 3388 |
| Western larch dwarf mistletoe risks | (2.7%) 163 | (97.3%) 5822 | 0 | 0 |
| Mixed conifer root disease risks | (3.6%) 214 | (7.0%) 419 | (77.2%) 4621 | (12.2 %) 732 |
| Tomentosus root and butt rot risks of spruce | (2.7%) 163 | (97.3 %) 5822 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (2.7%) 163 | (18.8%) 1122 | (62.9%) 3765 | (15.6%) 935 |
| Indian paint fungus risks of true firs | (2.7%) 163 | (97.3%) 5822 | 0 | 0 |

Subwatershed: **24B** Acres: **7,076**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.3%) 21 | (19.4%) 1371 | (23.7%) 1679 | (56.6%) 4004 |
| Ponderosa pine dwarf mistletoe risks | (0.3%) 21 | (1.0%) 74 | (35.4%) 2473 | (63.1%) 4508 |
| Western larch dwarf mistletoe risks | (0.3%) 21 | (99.7%) 7056 | 0 | 0 |
| Mixed conifer root disease risks | (1.0%) 74 | (1.1%) 75 | (67.1%) 4745 | (30.9%) 2183 |
| Tomentosus root and butt rot risks of spruce | (0.3%) 21 | (99.7%) 7056 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.3%) 21 | (17.1%) 1210 | (66.2%) 4402 | (20.4%) 1443 |
| Indian paint fungus risks of true firs | (0.3%) 21 | (99.6%) 7048 | (0.1%) 8 | 0 |

Subwatershed: **24C** Acres: **8,168**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.9%) 76 | (12.6%) 1027 | (23.5%) 1918 | (63.0%) 5147 |
| Ponderosa pine dwarf mistletoe risks | (0.9%) 76 | (9.0%) 732 | (32.0%) 2615 | (58.1%) 4746 |
| Western larch dwarf mistletoe risks | (0.9%) 76 | (99.1%) 8093 | 0 | 0 |
| Mixed conifer root disease risks | (1.2%) 96 | (0.4%) 28 | (59.2%) 4832 | (39.3%) 3212 |
| Tomentosus root and butt rot risks of spruce | (0.9%) 76 | (97.4%) 7954 | (1.7%) 138 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.9%) 76 | (11.0%) 898 | (67.2%) 5488 | (20.9%) 1707 |
| Indian paint fungus risks of true firs | (0.9%) 76 | (97.5%) 7962 | (1.6%) 131 | 0 |

Subwatershed: **24D** Acres: **3,682**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.8%) 30 | (22.0%) 850 | (58.0%) 2241 | (19.2%) 742 |
| Ponderosa pine dwarf mistletoe risks | (0.8%) 30 | (57.2%) 2210 | (32.0%) 1235 | (10.0%) 386 |
| Western larch dwarf mistletoe risks | (0.8%) 30 | (84.1%) 3250 | (15.1%) 583 | 0 |
| Mixed conifer root disease risks | (0.8%) 30 | (4.2%) 163 | (42.6%) 1644 | (52.4%) 2025 |
| Tomentosus root and butt rot risks of spruce | (0.8%) 30 | (94.6%) 3652 | (4.7%) 180 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.8%) 30 | (12.1%) 467 | (61.4%) 2372 | (25.7%) 994 |
| Indian paint fungus risks of true firs | (0.8%) 30 | (66.2%) 2558 | (33.0%) 1274 | 0 |

Subwatershed: **24E** Acres: **4,341**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.4%) 17 | (29.3%) 1272 | (40.7%) 1767 | (29.6%) 1284 |
| Ponderosa pine dwarf mistletoe risks | (0.4%) 17 | (32.9%) 1427 | (35.1%) 1522 | (31.7%) 1374 |
| Western larch dwarf mistletoe risks | (0.4%) 17 | (91.3%) 3963 | (8.3%) 361 | 0 |
| Mixed conifer root disease risks | (0.4%) 17 | (0.1%) 5 | (61.5%) 2670 | (38.0%) 1649 |
| Tomentosus root and butt rot risks of spruce | (0.4%) 17 | (94.2%) 4091 | (0.3%) 11 | (5.1%) 222 |
| Schweinitzii root and butt rot risks of conifers | (0.4%) 17 | (9.7%) 422 | (65.5%) 2843 | (24.4 %) 1060 |
| Indian paint fungus risks of true firs | (0.4%) 17 | (85.6%) 3714 | (14.1%) 610 | 0 |

Subwatershed: **24F** Acres: **6,230**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (7.0%) 436 | (39.2%) 2442 | (12.5%) 780 | (41.3%) 2572 |
| Ponderosa pine dwarf mistletoe risks | (7.0%) 436 | (11.3%) 706 | (28.2%) 1755 | (53.5%) 3334 |
| Western larch dwarf mistletoe risks | (7.0%) 436 | (92.5%) 5763 | (0.5%) 31 | 0 |
| Mixed conifer root disease risks | (9.5%) 594 | (8.0%) 519 | (64.7%) 4030 | (17.4%) 1086 |
| Tomentosus root and butt rot risks of spruce | (7.0%) 436 | (93.0%) 5795 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (7.0%) 436 | (29.7%) 1852 | (55.9%) 3482 | (7.4%) 460 |
| Indian paint fungus risks of true firs | (7.0%) 436 | (92.9%) 5790 | (0.0%) 5 | 0 |

Subwatershed: **24G** Acres: **5,674**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.6%) 33 | (36.1%) 2050 | (9.0%) 515 | (54.2%) 3075 |
| Ponderosa pine dwarf mistletoe risks | (0.6%) 33 | (0.8%) 48 | (34.1%) 1934 | (64.5%) 3659 |
| Western larch dwarf mistletoe risks | (0.6%) 33 | (99.4%) 5641 | 0 | 0 |
| Mixed conifer root disease risks | (0.9%) 50 | (7.0%) 399 | (85.2%) 4835 | (6.9%) 391 |
| Tomentosus root and butt rot risks of spruce | (0.6%) 33 | (99.4%) 5641 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.6%) 33 | (23.4%) 1329 | (71.2%) 4039 | (4.8%) 273 |
| Indian paint fungus risks of true firs | (0.6%) 33 | (99.4%) 5641 | 0 | 0 |

Subwatershed: **25A** Acres: **6,906**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (2.3%) 159 | (41.0%) 2835 | (18.5%) 1278 | (38.2%) 2635 |
| Ponderosa pine dwarf mistletoe risks | (2.3%) 159 | (14.3%) 988 | (34.5%) 2384 | (48.9%) 3376 |
| Western larch dwarf mistletoe risks | (2.3%) 159 | (97.0%) 6697 | (0.7%) 51 | 0 |
| Mixed conifer root disease risks | (2.7%) 184 | (7.2%) 498 | (83.1%) 5740 | (7.0%) 484 |
| Tomentosus root and butt rot risks of spruce | (2.3%) 159 | (96.4%) 6662 | (1.3%) 86 | 0 |
| Schweinitzii root and butt rot risks of conifers | (2.3%) 159 | (39.5%) 2726 | (57.1%) 3941 | (1.2%) 81 |
| Indian paint fungus risks of true firs | (2.3%) 159 | (97.7%) 6748 | (33.0%) 1274 | 0 |

Subwatershed: **25B** Acres: **7,884**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.6%) 46 | (41.6%) 3278 | (12.2%) 965 | (45.6%) 3596 |
| Ponderosa pine dwarf mistletoe risks | (0.6%) 46 | (27.1%) 2137 | (45.1%) 3558 | (27.2%) 2143 |
| Western larch dwarf mistletoe risks | (0.6%) 46 | (92.3%) 7277 | (7.1%) 562 | 0 |
| Mixed conifer root disease risks | (1.7%) 135 | (13.5%) 1067 | (50.0%) 3937 | (34.8%) 2744 |
| Tomentosus root and butt rot risks of spruce | (0.6%) 46 | (99.4%) 7839 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.6%) 46 | (37.2%) 2933 | (44.1%) 3475 | (18.2%) 1431 |
| Indian paint fungus risks of true firs | (0.6%) 46 | (85.6%) 3714 | (14.1%) 610 | 0 |

Subwatershed: **25C** Acres: **4,038**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.5%) 18 | (52.5%) 2121 | (20.2%) 813 | (26.9%) 1085 |
| Ponderosa pine dwarf mistletoe risks | (0.5%) 18 | (23.3%) 940 | (29.6%) 1196 | (46.6%) 1884 |
| Western larch dwarf mistletoe risks | (0.5%) 18 | (94.3%) 3808 | (5.2%) 212 | 0 |
| Mixed conifer root disease risks | (1.1%) 43.5 | (8.4%) 341 | (64.2%) 2592 | (26.3%) 1062 |
| Tomentosus root and butt rot risks of spruce | (0.5%) 18 | (99.5%) 4021 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.5%) 18 | (40.0%) 1616 | (52.3%) 2114 | (7.2%) 290 |
| Indian paint fungus risks of true firs | (0.5%) 18 | (99.5%) 4020 | 0 | 0 |

Subwatershed: **26A** Acres: **8,609**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (6.4%) 547 | (37.0%) 3188 | (39.8%) 3426 | (16.8%) 1448 |
| Ponderosa pine dwarf mistletoe risks | (6.4%) 547 | (25.5%) 2195 | (47.7%) 4104 | (20.5%) 1763 |
| Western larch dwarf mistletoe risks | (6.4%) 547 | (86.0%) 7400 | (7.7%) 662 | 0 |
| Mixed conifer root disease risks | (6.7%) 578 | (7.2%) 617 | (65.8%) 5668 | (20.3%) 1745 |
| Tomentosus root and butt rot risks of spruce | (6.4%) 547 | (93.6%) 8062 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (6.4%) 547 | (24.1%) 2076 | (63.7%) 5481 | (5.8%) 504 |
| Indian paint fungus risks of true firs | (6.4%) 547 | (93.6%) 8062 | 0 | 0 |

Subwatershed: **26B** Acres: **5,254**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.6%) 31 | (30.4%) 1595 | (26.5%) 1394 | (42.5%) 2234 |
| Ponderosa pine dwarf mistletoe risks | (0.6%) 31 | (33.2%) 1743 | (58.2%) 3056 | (8.0%) 423 |
| Western larch dwarf mistletoe risks | (0.6%) 31 | (96.9%) 5094 | (2.5%) 129 | 0 |
| Mixed conifer root disease risks | (0.6%) 31 | (10.2%) 537 | (62.9%) 3307 | (26.2%) 1378 |
| Tomentosus root and butt rot risks of spruce | (0.6%) 31 | (99.4%) 5223 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.6%) 31 | (26.3%) 1380 | (73.0%) 3838 | (0.1%) 5 |
| Indian paint fungus risks of true firs | (0.6%) 31 | (99.4%) 5223 | 0 | 0 |

Subwatershed: **26C** Acres: **8,574**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | 0 | (51.4%) 4410 | (32.4%) 2779 | (16.2%) 1385 |
| Ponderosa pine dwarf mistletoe risks | 0 | (60.9%) 5221 | (31.7%) 2721 | (7.4%) 633 |
| Western larch dwarf mistletoe risks | 0 | (65.6%) 5623 | (34.4%) 2952 | 0 |
| Mixed conifer root disease risks | 0 | (0.0%) 4 | (41.4%) 3547 | (58.6%) 5024 |
| Tomentosus root and butt rot risks of spruce | 0 | (100%) 8575 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | 0 | (8.5%) 725 | (75.1%) 6438 | (16.5%) 1412 |
| Indian paint fungus risks of true firs | 0 | (69.4%) 5949 | 0 | 0 |

Subwatershed: **26D** Acres: **7,372**

| Disease | No Data | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (1.2%) 88 | (42.7%) 3149 | (30.6%) 2254 | (25.5%) 1881 |
| Ponderosa pine dwarf mistletoe risks | (1.2%) 88 | (57.8%) 4259 | (29.1%) 2144 | (11.9%) 880 |
| Western larch dwarf mistletoe risks | (1.2%) 88 | (66.2%) 4881 | (32.2%) 2373 | (0.4%) 30 |
| Mixed conifer root disease risks | (1.7%) 128 | (2.8%) 206 | (36.4%) 2681 | (59.1%) 4358 |
| Tomentosus root and butt rot risks of spruce | (1.2%) 88 | (98.8%) 7284 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (1.2%) 88 | (8.8%) 652 | (63.8%) 4705 | (26.2%) 1928 |
| Indian paint fungus risks of true firs | (1.2%) 88 | (61.5%) 5276 | (23.4%) 2007 | (0.0%) 2 |

Subwatershed: **26F** Acres: **3,066**

| **Disease** | **No Data** | **% Low** | **% Med** | **%High** |
|---|---|---|---|---|
| Douglas-fir dwarf mistletoe risks | (0.1%) 2 | (17.8%) 546 | (38.2%) 1172 | (43.9%) 1346 |
| Ponderosa pine dwarf mistletoe risks | (0.1%) 2 | (39.9%) 1222 | (32.9%) 1009 | (27.2%) 833 |
| Western larch dwarf mistletoe risks | (0.1%) 2 | (89.6%) 2748 | (10.3%) 317 | 0 |
| Mixed conifer root disease risks | (0.1%) 2 | (3.1%) 96 | (38.4%) 1176 | (58.5%) 1792 |
| Tomentosus root and butt rot risks of spruce | (0.1%) 2 | (100%) 3064 | 0 | 0 |
| Schweinitzii root and butt rot risks of conifers | (0.1%) 2 | (14.3%) 439 | (82.3%) 2525 | (3.3%) 100 |
| Indian paint fungus risks of true firs | (0.1%) 2 | (99.6%) 3055 | (0.3%) 9 | 0 |

## Wall Creek Watershed Insect Risks by Subwatershed Percent of Area (and Acres)

Subwatershed: 24A Acres: 5,985

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 4.8 (290) | 95.1 (5,694) | 0 | 0 |
| Fir engraver risks | 0 | 100 (5,985) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (5,985) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 99.0 (5,923) | 1.0 (62) | 0 |
| Spruce Beetle Risks | 0 | 100 (5,985) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 37.4 (2,240) | 62.5 (3,742) | <0.1 (2) |
| Western spruce budworm risks | 0 | 7.3 (436) | 13.3 (797) | 79.4 (4,751) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 24B Acres: 7,077

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 100 (7,077) | 0 | 0 |
| Fir engraver risks | 0 | 100 (7,077) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (7,077) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 99.1 (7,015) | 0.9 (62) | 0 |
| Spruce Beetle Risks | 0.1 (7) | 99.9 (7,070) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 34.0 (2,405) | 66.0 (4,671) | 0 |
| Western spruce budworm risks | 0 | 1.1 (78) | 12.2 (863) | 86.8 (6,129) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 24C Acres: 8,169

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 100 (8,169) | 0 | 0 |
| Fir engraver risks | 0 | 100 (8,169) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (8,169) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 99.3 (8,111) | 0.7 (58) | 0 |
| Spruce Beetle Risks | <0.1 (4) | 98.2 (8,024) | 1.7 (141) | 0 |
| Douglas-fir tussock moth risk | 0 | 37.9 (3,096) | 62.1 (5,073) | 0 |
| Western spruce budworm risks | <0.1 (1) | 4.1 (335) | 18.0 (1,469) | 77.4 (6,325) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 24D Acres: 3,863

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 97.6 (3,772) | 0 | 2.4 (91) |
| Fir engraver risks | 0 | 100 (3,863) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (3,863) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 96.4 (3,725) | 2.9 (113) | 0.6 (24) |
| Spruce Beetle Risks | 7.1 (273) | 88.3 (3,409) | 4.7 (180) | 0 |
| Douglas-fir tussock moth risk | 0 | 74.0 (2,860) | 26.0 (1,003) | 0 |
| Western spruce budworm risks | <0.1 (1) | 9.5 (367) | 7.4 (286) | 79.4 (3,006) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 24E Acres: 4,341

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 1.4 (61) | 97.8 (4,245) | 0 | 0.8 (35) |
| Fir engraver risks | 0 | 100 (4,341) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (4,341) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 99.8 (4,334) | 0.2 (7) | 0 |
| Spruce Beetle Risks | <0.1 (2) | 94.6 (4,106) | 5.4 (234) | 0 |
| Douglas-fir tussock moth risk | 0 | 72.2 (3,135) | 27.8 (1,206) | 0 |
| Western spruce budworm risks | 0.1 (3) | 3.4 (149) | 17.0 (738) | 79.2 (3,439) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 24F Acres: 6,231

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 100 (6,231) | 0 | 0 |
| Fir engraver risks | 0 | 100 (6,231) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (6,231) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 97.2 (6,059) | 2.8 (172) | 0 |
| Spruce Beetle Risks | 0 | 100 (6,231) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 53.8 (3,353) | 45 (2,807) | 1.1 (71) |
| Western spruce budworm risks | 0 | 6.1 (379) | 26.3 (1,636) | 67.6 (4,215) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 24G Acres: 5,674

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 4.4 (249) | 95.6 (5,425) | 0 | 0 |
| Fir engraver risks | 0 | 100 (5,674) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (5,674) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 98.9 (5,610) | 1.1 (64) | 0 |
| Spruce Beetle Risks | 0 | 100 (5,674) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 36.6 (2,077) | 63.3 (3,595) | <0.1 (3) |
| Western spruce budworm risks | 0 | 3.3 (186) | 11.0 (625) | 85.4 (4,844) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 25A Acres: 6,907

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0.9 (66) | 99.0 (6,841) | 0 | 0 |
| Fir engraver risks | 0 | 100 (6,907) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 100 (6,907) | 0 | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 96.8 (6,688) | 3.2 (219) | 0 |
| Spruce Beetle Risks | 0.2 (14) | 98.5 (6,807) | 1.2 (86) | 0 |
| Douglas-fir tussock moth risk | 0 | 63.5 (4,385) | 36.5 (2,522) | 0 |
| Western spruce budworm risks | 0.1 (4) | 9.5 (658) | 20.4 (1,411) | 68.3 (4,721) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 25B Acres: 7,884

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 9.0 (711) | 90.5 (7,139) | 0 | 0.4 (34) |
| Fir engraver risks | 0 | 100 (7,884) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 98.6 (7,772) | 1.4 (112) | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 96.8 (7,633) | 3.2 (251) | 0 |
| Spruce Beetle Risks | 11.5 (907) | 88.5 (6,978) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 73.0 (5,758) | 27.0 (2,126) | 0 |
| Western spruce budworm risks | 0.5 (39) | 22.5 (1,773) | 16.8 (1,327) | 60.2 (4,745) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 25C Acres: 4,039

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 100 (4,039) | 0 | 0 |
| Fir engraver risks | 0 | 100 (4,039) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 96.2 (3,884) | 3.8 (155) | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 98.2 (3,966) | 1.6 (66) | 0.2 (7) |
| Spruce Beetle Risks | 7.9 (321) | 92.1 (3,718) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 45.1 (1,823) | 54.8 (2,214) | <0.1 (2) |
| Western spruce budworm risks | <0.1 (1) | 9.3 (375) | 19.9 (805) | 68.6 (2,771) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 26A Acres: 8,609

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0.3 (30) | 99.6 (8,579) | 0 | 0 |
| Fir engraver risks | 0 | 100 (8,609) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 88.5 (7,618) | 11.5 (991) | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 94.1 (8,100) | 5.9 (509) | 0 |
| Spruce Beetle Risks | 1.5 (126) | 98.5 (8,482) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 44.0 (3,785) | 56.0 (4,822) | <0.1 (2) |
| Western spruce budworm risks | 0 | 5.8 (504) | 17.0 (1,465) | 70.1 (6,035) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 26B Acres: 5,254

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 100 (5,254) | 0 | 0 |
| Fir engraver risks | 0 | 100 (5,254) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 67.1 (3,527) | 32.9 (1,727) | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 99.3 (5,219) | 0 | 0.7 (35) | 0 |
| Spruce Beetle Risks | 3.5 (182) | 96.5 (5,072) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 52.8 (2,777) | 47.1 (2,477) | 0 |
| Western spruce budworm risks | <0.1 (1) | 5.4 (283) | 3.2 (166) | 72.8 (3,825) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 26C Acres: 8,575

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 99.2 (8,503) | 0 | 0.8 (72) |
| Fir engraver risks | 0 | 100 (8,575) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 33.4 (2,861) | 65.9 (5,648) | 0 | 0.8 (66) |
| Mountain pine beetle (PP) risks[2] | 0 | 99.5 (8,536) | 0.4 (38) | 0 |
| Spruce Beetle Risks | 0 | 100 (8,575) | 0 | 0 |
| Douglas-fir tussock moth risk | 0 | 13.6 (1,170) | 86.2 (7,393) | 0.1 (12) |
| Western spruce budworm risks | 0 | 0 | 1.6 (142) | 97.8 (8,390) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 26D Acres: 7,372

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 98.7 (7,277) | 0 | 1.3 (95) |
| Fir engraver risks | 1.0 (76) | 99.0 (7,296) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 64.5 (4,755) | 34.5 (2,542) | 0 | 1.0 (75) |
| Mountain pine beetle (PP) risks[2] | 1.3 (93) | 97.5 (7,189) | 1.2 (90) | 0 |
| Spruce Beetle Risks | 0.6 (47) | 99.3 (7,321) | <0.1 (4) | 0 |
| Douglas-fir tussock moth risk | 0 | 39.6 (2,916) | 60.1 (4,431) | 0.3 (24) |
| Western spruce budworm risks | 0.2 (18) | 6.4 (469) | 11.3 (834) | 77.4 (5,704) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine

Subwatershed: 26F Acres: 3,066

| Insect | %Missing | % Low | % Med | %High |
|---|---|---|---|---|
| Douglas-fir beetle risks | 0 | 99.5 (3,052) | 0 | 0.5 (14) |
| Fir engraver risks | 0 | 100 (3,066) | 0 | 0 |
| Mountain pine beetle (LPP) risks[1] | 78.7 (2,415) | 21.2 (65) | 0 | 0 |
| Mountain pine beetle (PP) risks[2] | 0 | 99.9 (3,065) | 0 | <0.1 (1) |
| Spruce Beetle Risks | 1.8 (55) | 98.2 (3,012) | 0 | ,0 |
| Douglas-fir tussock moth risk | 0 | 54.0 (1,655) | 46.0 (1,410) | 0.1 (2) |
| Western spruce budworm risks | 0 | 1.5 (47) | 13.3 (408) | 78.6 (2,409) |

[1]LPP = Lodgepole pine; [2]PP = Ponderosa pine